

REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections and further examination are requested. Upon entry of this amendment, claims 1-6 and 8-11 are amended, leaving claims 1-20 pending with claim 1 being independent. No new matter has been added.

Rejections Under 35 U.S.C. §112, second paragraph

Claims 1-20 have been rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner contends that the limitation, “the one” in claim 1 lacks antecedent basis, and the limitation “a surface roughness” in claim 2 is unclear.

Claims 1 and 2 have been amended to overcome this rejection.

Additionally, the Examiner states that the limitation “a surface roughness of 2.0 μmRa or less” contradicts the range (0.5 μmRa or less) in claim 1. However, Applicants note that the range in claim 1 is “0.5 μmRa or more”. Therefore, Applicants submit that there is no contradiction between these ranges, and request that this rejection be withdrawn.

Rejections Under 35 U.S.C. §102(b)

Claims 1, 6 and 7 have been rejected under 35 U.S.C. §102(b) as being anticipated by Komori et al. (CN 1453481, U.S.P. 7,025,505 used as English equivalent).

Applicants submit that independent claim 1 as now pending is allowable over the cited prior art. Specifically, independent claim 1 recites a fluid bearing device wherein at least one of a second member and a housing has an adhesion portion and is formed of resin, and wherein the adhesion portion of the at least one of the second member and the housing formed of resin has a roughened surface having a surface roughness of 0.5 μmRa or more, and wherein the roughened surface is formed by injection molding.

Applicants submit that the cited prior art fails to disclose or render obvious such a

device. In particular, Komori simply fails to disclose " the adhesion portion of the at least one of the second member and the housing formed of resin has a roughened surface having a surface roughness of 0.5 μmRa or more." Komori, in column 14, lines 15-21, discloses that at least one of the upper end surface, the lower end surface, and the outer peripheral surface of the bearing sleeve 8 has a surface roughness of 0.5 Ra or more. This surface roughness is required to prevent resin separation when the housing is formed from a resin through injection molding and since, the bearing sleeve is an inserted member, as described in column 14, lines 3-9 of Komori. Even when the bearing sleeve is formed of a non-porous metal material other than a sintered metal, such as stainless steel or brass, this surface roughness facilitates an anchoring effect to connect the housing with the bearing sleeve reliably with sufficient connecting strength. Komori, however, specifies the surface roughness of an adhesion portion of a metal member, not the surface roughness of an adhesion portion of a resin member, as recited in claim 1.

Moreover, when forming an object by integrating two members by insert molding, the interface is present only between the two members, and thus the anchoring effect provided by roughening the surface of the inserted member increases the connecting strength between the two members. On the other hand, when fixedly bonding two members, interfaces are present between the adhesive (the adhesive layer) and the first member, as well as between the adhesive layer and the second member; therefore, unless both of the surfaces of the two members contacting the adhesive layer solidly adhere to the adhesive, the two members cannot be connected (secured) to each other with sufficient strength. The present invention focuses on the problem that resin is weaker than metal in adhesion strength to the adhesive layer, and overcomes this problem.

Arguably, Komori discloses a structure to bond a bearing sleeve fixedly to a resin housing on, e.g., column 11, lines 6-8 and column 14 and lines 22-27; however, in Komori, there is no disclosure that the surface of an adhesion portion of a member made of resin (e.g., the housing) is roughened as recited in the present claims. Accordingly, even if a bearing sleeve of a sintered metal or a bearing sleeve that is made of a non-porous metal material, such as stainless steel and has a roughened adhesion portion is fixedly bonded to the inner periphery of the resin

housing as described in Komori, the housing and the bearing sleeve cannot be bonded reliably to each other with sufficient connecting strength.

In contrast, setting the surface roughness of an adhesion portion of a member made of resin (e.g., the housing) to 0.5 μmRa or more enables adhesive to infill recesses and protrusions of the roughened adhesion portion in bonding the resin housing with another member (e.g., " the metal bearing sleeve), thereby providing an anchoring effect, so that the adhesion strength of the resin housing can be increased relative to the adhesive layer. Meanwhile, the adhesion strength of the metal bearing sleeve to the adhesive layer is sufficient without any particular roughening treatment. Hence, according to the present invention, the resin housing and the second member can be solidly bonded and fixed to each other.

In addition, the structure as recited in amended claim 1 enables a surface roughened at a desired level of precision to be obtained stably at low cost. This can reliably increase the adhesive strength between the housing and second member, thereby providing a fluid bearing device with excellent durability and reliability.

Additionally, Applicants submit that there is no reasoning in the prior art to modify Komori such that it would have rendered claim 1 obvious. Therefore, Applicants submit that claim 1 and its dependent claims are allowable over the cited prior art.

Rejections Under 35 U.S.C. §103(a)

Claims 2-5 and 8-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Komori et al., as applied to claim 1 above.

Applicants submit that since each of these claims is dependent from claim 1, they are allowable for the reasons set forth above.

Conclusion

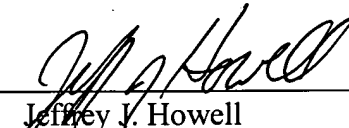
In view of the foregoing amendments and remarks, all of the claims now pending in this application are believed to be in condition for allowance. Reconsideration and favorable action are respectfully solicited.

Should the Examiner believe there are any remaining issues that must be resolved before this application can be allowed, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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June 12, 2009